

MICROSINGULARITIES: BODY INTELLIGENCE NEUROPLASTICECOLOGIES AND ANTISMART ARCHITECTURES IN THE ALGORICENE

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Abstract

The paper discusses the distinction between: 1. neuroflexibility, as the capacity to adapt to hyperattention environments in smart ecologies of control that reduce the sensory and kinetic spectrum, and 2. neuroplasticity as the capacity to mobilize a larger sensory spectrum that may resist control ecologies. The latter would also be a means for promoting a neurodiverse culture in which sensory and cognitive ratios other than rational consciousness may proliferate and coexist. Neuroplastic environments are described as microsingularities defining their own sensory ratios yet open and in continuous reconfiguration, while resisting the thrust to total control implicit in the culture of Technological Singularity. Microsingularities, by enabling modes of deep attention and plastic perception are presented as crucial mode of political resistance to a hypercontrol culture, mobilizing non-conscious spectrums of experience.

Keywords

Neuroplasticity, neurodiveristy, singularity, smart technologies

Flexibility vs. plasticity

Within current debates of AI and digital culture in general issues of cognition and of neuroplasticity are becoming more and more relevant, especially as plasticity is hayled as effect or property of digital ecologies.

In this context I will start discussing Catherine Malabou's crucial distinction between neuroflexibility and neuroplasticity (Malabou 2008).

Neuroflexibility is the cognitive capacity to continually re-adapt to changing landscapes in digital ecologies of dispersed (hyper)attention where smart technologies of control continuously redirect the attention of interactors. I argue that this happens through interfaces (affordances) that reduce the sensory spectrum following the model initiated nearly 600 years ago with Renaissance perspective, as is clear in the case of the smartphone, which still bears traces of the window based geometry and discrete tactility model inaugurated by Leon Battista Alberti's theory of linear perspective. This model is based on sensory immobility and the complete predominance of vision, radically reducing the multisensory spectrum of experience. In smart ecologies of control we

readapt within a landscape of sensory ratios that is already highly articulated in strict geometric ratios.

Instead neuroplasticity is a less adaptive and more creative and emergent capacity for reconfiguration of cognitive potentials. I associate cognitive plasticity to perceptual plasticity, i.e. the capacity to continually recompose the way in which multiple sensing modalities integrate (so called multisensory integration), while conforming our experience, always in motion.

Enaction and intra-action

The relation between relational movement and cognition is found, amongst others, in Francisco Varela's account of enactive cognition, which proposes that cognition (literally synapsis in the brain) emerges with our movements in relation to an environment (Varela, Thomson and Rosch 1993). I take this further by stating that the environment itself is no other than a field of movement relations and, more importantly, that this field can be more or less emergent, indeterminate and open, more or less predefined and closed.

Some relational fields have coalesced over centuries into fixed geometric ecologies, setting the ground for the Age of the Algorithms which I call Algoricene, foregrounding calculability and quantification. Such is the case of perspective based ecologies prevailing today in ubiquitous screens and algorithmic culture, where relations and bodies are choreographed in precise geometries and splits, following the model inaugurated by Leon Battista Alberti's treatise *De Pictura* in Florence in 1436.



Fig 1. Engraving by Albrecht Dürer showing a perspective machine, ca. 1525. (OASC, Public Domain - Metropolitan Museum of Art)

Other ecologies, as in numerous indigenous cultures, in non-human animal ecosystems, in bacterial colonies, or even in

many aspects of human experience within Eurocentric (perspectival) culture, may show a less fixed organization of sensory ratios, with more open-ended and emergent properties in terms of how multisensory integration (the way in which sensing modalities always cooperate and relate to one another in experience) and motion are continually reconfiguring the ways in which relations and relata may co-emerge defining their very field in the process.

One could thus relate flexibility to a conservative paradigm of *interaction*, in which relations happen following an imposed schema (perspective), whereas plasticity could be relate to Karen Barad's notion of *intra-action* (Barad 2007) where the conditions of a relational field are not set in advance but co-emerge in the very process together with the agencies relating.

Non-conscious cognition and resistance

N. Katherine Hayles discusses in *How we Think* Malabou's definitions between flexibility and plasticity and states that "Whereas flexibility is all about passive accommodation to the New World Order, plasticity has the potential for resistance and reconfiguration" (Hayles 2012, 101).

But Hayles also points out that Malabou's response is limited to the possibilities of conscious action and follows saying, "but as we have seen, unconscious and nonconscious levels of awareness are also affected (arguably even more than consciousness) by the accelerating pace and "flexibility" demands of global capitalism. How can they be mobilised for resistance? For this Malabou has no solution." (Hayles 2012, 102).

The relational accounts of cognition here discussed resonate in Katherine Hayles' notion of cognitive nonconscious (Hayles 2017) focusing on the cognitive processes that continuously happen in the bodies, (technical, animal, human, unicellular, plant) different from rational consciousness, and from the subconscious and the material processes. These processes exceed accounts of individual consciousness pointing to cognitive assemblages that afford an ecological approach to cognition (already present in Gibson, Varela, Clark and Chalmers, Alva Noë and others). This approach is all the more relevant as such assemblages conform a planetary techno-human cognitive ecology that calls for an eco-ethical understanding. As Artificial Intelligence and Big Data systems take over the rational subject of humanism and its reflexive reason, theories proliferate that account for this paradigm shift.

Alfred North Whitehead's concept of prehensions, as well as noncognitive nonconscious thinking-feeling in Brian Massumi's work (2002, 2011), or in a different way Steven Shaviro's *Discognition* present more radical denials of consciousness and the cognitive paradigm. Steven Shaviro's account of the slime molds (Shaviro 2015, 193) goes in this direction, pointing to propagations of rhythms as the underlying mode of articulation of thought, requiring no brain as node of neural connections. This in turn leads to a rethinking of intelligence as distributed property of ecologies exceeding rational consciousness and which I refer to as BI (Body Intelligence).

Of particular relevance in understanding the relation between movement-perception, nonconscious processes and control ecologies, are pre-motor potential theories. In 1964 Hans Helmut Kornhuber and Lüder Deecke at the University of Freiburg in Germany reported their discovery of the *Bereitschaftspotenzial*, readiness potential, or pre-motor potential (Kornhuber and Deecke 1965) as the activity in the motor cortex and other areas of the brain preceding conscious movement. Benjamin Libet's experiments in the 1980's further connected premotor activity to volition, questioning the primacy of "free will" in movement through the "missing half second" in which the body-brain activates *before* the conscious decision to move is taken (Libet 1983).

I argue that digital control operates mostly in the "missing half second", i.e. in the non-conscious spectrum of experience. This in turn relates to Brian Massumi's concept of Ontopower (Massumi 2015) as a mode of power that manages emergence itself, not the already defined.

Planetary scale computation and Big Data systems reorient our perceptions and actions in non-conscious splits of a second, operating always in the missing half second of experience, before the arrival of rational consciousness. They do so however because we orient experience through aligning with affordances (interfaces) which radically reduce in advance our motor-sensory spectrum by imposing a perspectival geometry based on fixed visual alignment to a frame-window-screen, where the only remainder of motion is in the discrete, algorithmic movements of fingers and eyes, exactly like in the model introduced 600 years ago by perspective.

Smart control ecologies associated to flexibility also relate to what Antoinette Rouvroy (2012) calls algorithmic governmentality, which operates through the ongoing reattunement of the digital environment performed by increasingly autonomous algorithms in Big Data systems which attempt to anticipate or preempt future potential movements or desires, a logic of preemption that, as previously mentioned, Brian Massumi (2015) calls Ontopower, as it operates on emergence rather than on things as already formed.

Thus, the movement measurement and reorientation of our actions and perceptions is still grounded on perspectival interfaces and affordances, but is now modulated through planetary scale computation systems that reorient our movements in non-conscious splits of a second.

In such a scenario rational consciousness is limited as it reflects a minimal aspect of the cognitive and experiential spectrum and arrives always too late, so it cannot be thought as the sole means of resistance to control. In this paper will try to respond to the question raised earlier by Katherine Hayles: how can we mobilize non-conscious experience for resistance? I will propose mobilising non-conscious spectrums of experience in ways that may resist passive accommodation to smart ecologies of control.

Smart ecologies, preemption and Singularity

Smart Control ecologies are linked to the development of AI (Artificial Intelligence) and to the culture of Technological

Singularity which expects to produce a general Artificial Intelligence around the year 2045.

A singularity is an event that generates its own conditions, thus Technological Singularity (TS) entails the unknowability of what an AI presumably superior to biological intelligence could be like. Yet paradoxically TS is also linked to a thrust for total control and an attempt to reach individual immortality through mind uploading, following the reductive accounts of intelligence that define it as a disembodied process happening in the brain. TS is thus a sort of black hole singularity with a will to capture the entire world in a totalizing ecology of control.

But as we have seen intelligence and cognition are not bound in the brain, rather, following numerous accounts of embodied and distributed cognition, it has to do with dynamic and distributed relations of movement and perception, it's thus always ecological, rather than individual.

Rethinking plasticity

I will now confront the radical sensory hierarchy of Renaissance perspective underlying control ecologies today, with other less reductive modes of organizing perception.

One cue into this is Erin Manning's (2017) notion of *autistic perception* as the (neurodiverse) perception that is open to the uncategorised. Another is Massumi's (2002, 192) suggestion to use proprioception as main reference for experience. Proprioception is the sense of internal movement of the body and yet it relates to all sensing modalities and is always relational. It requires no external reference, it's the reverse of perspective as fully exoreferential paradigm.

Our understandings of movement and of ourselves and the world is highly biased by mechanistic/Newtonian/Cartesian views which are biased by perspective, assuming a fixed external observer that is associated to a disembodied mind. This kind of perception biases our experience in the world and the way we move conforming our social-cognitive ecologies.

By focusing on proprioception I propose a reverse move in which rather than assuming a fixed exoreferential view point, we are located inside of our proprioception, as a highly diffuse cloud of sensations across all sensing modalities (think of how your sense of internal movement disseminates across changing and unique combinations of pressure, touch, temperature, tension, torsion, etc. even as you sit, readjusting your posture while reading this paper or listening to me).

I propose the trope of the proprioceptive swarm to understand the indeterminate nature of proprioceptive experience and propose it as main general plane of cross referencing to rethink how experience operates, thus inverting the perspectival and mechanical tradition that foregrounds an external and exoreferential, measurable account of experience.

This however implies an already expanded account of proprioception as involving an always changing and emergent multisensory integration and a relation to an environment, this is what I call the *alloceptive swarm*, where proprioception is always opening up and in becoming, and has a blurry, dynamic and distributed swarm-like nature that is always there sustaining experience, on the verge of consciousness, but clearly exceeding it.

I suggest that in every experience multisensory integration and movement (the alloceptive swarms) recombine in highly varied, more or less open ways. Perspective is an example of a closed ecology.

The problem is the technology

The *Algoricene* is my name for the current Age of the Algorithms, where reductive perceptual organizations dominate the ecologies since several millennia ago. Perspective and gridded environments were already algorithmic technologies that foregrounded a reductive mode of directed and measurable experience by imposing a geometrical, algorithmic and fixed exoreferential logic, setting the ground for the more dynamic algorithms, modes of preemption and control in cybernetics and Big Data culture.

The Algoricene suggests that algorithms are not a neutral technology, rather they have an implicit reductive thrust and will to domination, and to autonomy, emergence and opacity, as is becoming clear in Big Data culture, of which the Cambridge Analytica and Facebook scandal is not an exception but the norm.

Mobilising perceptual resistances

In face of the reductive perceptual regimes underlying smart ecologies of control, how to mobilize more plastic multisensory ecologies?

I propose to mobilize plasticity by thinking about the degrees of plasticity of perceptual ratios in terms of transmodal sensory integration, taking proprioception as the main reference. How open is the reconfiguration of multisensory integration, will be a measure of openness of an ecology. Its degree of endo-referentiality, rather than exo-referentiality will be another.

By mobilizing proprioception and transmodal sensory integration it's possible to enact plastic sensory ecologies in constant reconfiguration from within, not as the adaptation to external references.

Motor-cognitive plasticity will be in this open reconfiguration emerging from within proprioceptive and transmodal experience.

Neurodiverse Futures, Perceptual Democracy, Microsingularities and Body Intelligence

Neurodiversity is a way of referring to the incapacity to align with the dominant sensory ratios of algorithmic, linear, perspectival ecologies. Neurodiverse people perceive and think along other ratios. A neurodiverse culture must include sensory plasticity and avoid the imposition of a dominant sensory-cognitive mode. Such *perceptual generosity* will be crucial for a radical *democracy or perception*.

Flexibility in smart control environments relates to what Hayles calls hyperattention, as a dispersed attention that modulates cognitive capacities, a superficial attention denounced also by Nicholas Carr in *The Shallows*. Antoinette Rouvroy (2012) also refers to how algorithmic governmentality prevents the constitution of a subject by constantly reattuning the digital ecology, thus exceeding neoliberalism, which was based on subjectivity production. This in turn connects to Gilles Deleuze's (1991) notion of

dividual, as the infinitely divisible that substitutes the individual in control societies.

Developing plastic perceptual ecologies instead demands deep modes of attention, yet open ones, in which sensory ratios reconfigure in emergent fields of relations. This is also a mode of resistance to the exponential black hole of Technological Singularity and its totalizing tendency to control, which imposes a reductive perceptual ecology. These fields are not individuals but ecologies, or what I call *metabodies*.

Microsingulatities would be such emergent fields defining their conditions in opened ways, rather than imposing their ratios onto other ecologies as is the case in Technological Singularity.

Moving away from the brain-based model of AI, promoted by perspective as regime of perceptual immobility and radical hierarchy of external vision, immediately implies mobilizing thought and cognition as a much more distributed bodily process.

Instead of AI as a reductive simulation of a reductive brain-based model of intelligence, I propose to mobilize BI (Body Intelligence) as the capacity to reconfigure sensory ratios in the relation to other bodies and environments. This implies literally moving in new ways.

Metatopias as antismart architectures

This approach is what I develop in the Metatopia intra-active metaformance environments that have been developed in the Metabody EU project¹. Metatopias are nomadic spaces of illegible behaviours that may infuse indeterminacy in smart control ecologies of Big Data culture. The experiential is crucial in these projects. The performer and the installation facilitate a transformative perceptual experience of the audience participants who stop being spectators and become the very substrate of the process of perceptual opening. I call this process of perceptual opening metaformance, expanding the definition proposed by Claudia Giannetti (1997). Metatopia works against the spectacular regime of perceptual separations. The Ambiguity of sensory perception is the characteristic aspect of these environments, and their focus on proprioception, on plastic multisensory integration, amorphous affordances, and the entangled co-emergence of perception and non-linear space.



¹ Extensive documentation is available in www.metatopia.eu and www.metabody.eu.

Fig. 2: METATOPIA - Metaformance in Toulouse 2016, Metabody Forum. © Jaime del Val. Photo: Reverso.

One of the layers of Metatopia is *Amorphogenesis*², a *metagaming* project in which amorphous digital architectures and spatialised electronic sound are further deformed through sensors disseminated on the body. Metagaming design avoids manual control, representation of Cartesian spaces, or simulation of anthropomorphic avatars, and develops non linear correlations between the movements of the intra-actor and the deformations of the architecture. *Metagaming* is not about affording control, rather it is about inviting unpredictable gestures to happen, while constituting an open (neurodiverse) cognitive landscape of amorphous and indeterminate affordances. It's about creating a non Cartesian architecture that emerges with the movement, a non linear space that is never actualising in an extensive space, never available to navigate.

One is never in control of the space, rather the intra-actor's sensations emerge in the process, as the body explores subtle and alien changes in tilting and acceleration, which expand proprioception into the digital meshes. Your micro-torsion of an arm and shoulder suddenly connects in alien manners with the torsion of the architecture, which could also be an alien creature, an abstract or amorphous avatar. Metagaming thus subverts and inverts the aesthetics of simulation and control, based on manual control, Cartesian spaces, anthropomorphic avatars and linear relations. In *Amorphogenesis* the digital architectures are an extension of the body's proprioception as much as the body is an extension of the architectures.

The architectures are projected on mobile and translucent Flexinamic structures, either indoors or outdoors, thus becoming a nomadic environment which dialogues with other spaces while constituting itself a relational field. The more varied the movements the richer the environment, promoting an anti-choreographic embodied knowledge. *Amorphogenesis* is also a philosophical concept proposed by me that signifies the ongoing emergence of the amorphous which never actualizes in a form.

Metatopias are proposed as antismart architectures that disalign perception from perspectival affordances and mobilize proprioception and multisensory integration as non-conscious experiential resistance to smart ecologies of control in Big Data Culture.

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²<http://metabody.eu/amorphogenesis/>

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